

Study course plan

1st Semester

Elements - Spatial Structures

Thresholds: structures, forms and bodies

The seminar analyzes and compares the thresholds between the different approaches to structure and space. An in-depth examination of choreographies in urban and natural spaces, e.g., the rush hour at subway stations, the movement of paper in an office building or the mass migration of red crabs on Christmas Island. Further research topics include organismic morphology and its representation, the examination of spatial practices in a historical context and how to address architecture 'beyond construction'.

Elements - Media Technologies

Thresholds: the history and theory of measuring

The seminar deals with the history and practices of measuring as a means of representing nature through a system of symbols. The first stage provides instruction about the history and theory of numbers, with the Sumerian sexagesimal system as a case in point. The second stage concerns the adaptation of the place-value system, including a short introduction to the problem of the zero and the formation of algebra. Against this background, the third stage of the seminar is an overview of instruments, techniques and sensors for analogue and digital measuring with a focus on the 19th century. Continuing into the 20th century, the problem of resolution and scale will be discussed in a fourth stage.

Elements - Design Strategies

Thresholds: Do you matter? - Perception, communication and transformation

The seminar deals with the threshold between mind and matter, focusing on the threshold itself as communication – in that crossing thresholds involves a transformation of qualities. This transformation can be made in different media and with different strategies to choose from, starting with the sketch. Sketching the world with pencil and paper is a process of choosing, from a multitude of possibilities, to draw a line, to choose what is important, to connect to an idea, to set a system of relations. 'Sketching' can be done by drawing, discussing, measuring, theorizing, prototyping etc. Creating newness in this way is about creating new relations.

Exercise Elements

This sub-module provides an introduction to the basic skills that will be applied in the laboratory elements. Connecting to the design strategy seminar and its topics, from sketching to modeling, the students will learn the basics of digital drawing tools, image manipulation and professional 3D modeling tools. In connection with the media technology seminar, the students will build their own hardware project based on the easy-to-use microcontroller platform.

Laboratory Elements

In the laboratory module, students apply the theoretical knowledge and practical skills learned over the course of the semester. Interdisciplinary teams of students will be asked to observe, analyze and understand diverse threshold situations. Finally, teams will formulate a design proposal to redefine the relations of the researched situations. A presentation of their research and findings to the whole group will conclude the laboratory module. ►

2nd Semester

Experiments - Spatial Structures

Designing Openness: Sequences – Folding – Objects

The seminar examines different aspects of sequences: 'From sequential Code to 3D code': sequences of signs /information units will be analyzed in texts, codes and objects. The operative character of stretching, twisting and bending defines the character of the structure; examples will be given, from Fuller's Synergetics to the different hierarchical structures of nature. 'From Sequence to Structure in Biology': relations between sequence, structure and function and the influence of primary structures on flexibility, switching, bending and stretching.

Experiments - Media Technologies

Designing Openness: Barriers

The seminar analyzes diverse systems and tools used in the development and implementation of experiments, such as different software (Labview, Arduino, Rhino), prototyping, history and the theory of measurement of contact-barriers and synapses, data in complex systems, visualization and statistics.

Experiments - Design Strategies

Designing Openness: Connecting

Drawing on the material and symbolic interdependence of opening and closing, connecting and separating as basic operations across disciplines and sectors, the seminar examines the theoretical and practical design strategies towards openness. Framing them in a historical context will highlight the 'designing of openness' as an epistemic practice, its relation to analysis in the different types of experiments and their designs and its application across the natural and social sciences and engineering.

Exercise Experiments

This sub-module researches types of barriers and how they can be brought into the model of the experiment. The contextual fields to be researched are autism, health issues, language, light barriers, temperature, physical material and structures.

Laboratory Experiments

A laboratory experiment consists of measuring the 'response' of a material in different conditions, after a certain 'perturbation' is exerted on the material from an external media. Measure is then done using a specific sensor. Examples of physical and chemical modification of materials will be performed in the laboratory. New materials will be characterized experimentally through available techniques. Based on the obtained results, it should be possible to predict how a material must be treated in order to improve its properties. In this way, we can compare the different approaches of design, science and the humanities on the optimization of material performance.



3rd Semester

Module Projects - Spatial Structures

Growth - Structures in Becoming

The goal of this seminar is to investigate how structures evolve, change, grow or remodel through time from three perspectives: design, cultural history and biological materials sciences. The seminar will be divided into three components corresponding to each of these disciplines. The first part of the seminar is in the form of lectures providing an overview of current themes of growth in biology. The second part focuses on the history of mechanics in biology. A third topic to be investigated is the link between structure and function relationships in self-moving materials and their implementation in the design of objects.

Module Projects - Media Technologies

Growth: Time of Technology – Technology of Time

Changes in structures over time can be understood as a function of technology. On the one hand, technology 'produces' time (historicity); on the other hand it allows manipulation through time (as an instrument of growth). An example is Moore's Law (the materiality of exponential growth); for almost 60 years, Moore's Law has defined the pace of innovation in the computer industry by 'stating' exponential growth: every two years or so, the number of transistors on a chip doubles while the price of the transistor is halved. Moore Law's connects the macroeconomic roadmap with microphysical structures on chips. The seminar will examine the very complex nature of this 'connection' in the epistemic core of such unprecedented growth.

Module Projects - Design Strategies

Growth: Dimensions of growth in design processes

There are multiple dimensions of growth, which play a role in design processes and in design decisions. First, the seminar discusses the historical perspectives of growth in design, including digitalization and mobility, or genealogy in the development of design. Second, the seminar discusses and teaches methods of finding forms and producing variations through growth, such as minimizing, maximizing, scaling, and multiplication. Third, the seminar focuses on complexity as a growth process in projects as well as in design, production and distribution. The students deal with growth and complexity both as a challenge and a practice.

Exercise Projects

In these exercises, students learn about tools for developing and presenting their projects. This includes prototyping skills (paper, rapid prototyping, physical computing), forms of visualization (sketching, illustrating, data visualization), simulation (Coding, Film, CAD) and the construction of (user) scenarios. Moreover, students learn project management skills (projecting, organizing, staffing, communicating, cooperating, operating, realization, budgeting).

Laboratory Projects

The laboratory project highlights the knowledge and techniques learned by the students in the first two semesters and helps students to develop the theme of their thesis. In the laboratory project on growth, students work in interdisciplinary groups, developing management skills and learning about stages of project development.



Intercultural Competence

This seminar uses an anthropological perspective to study the historical and cultural construction of design concepts and the behavior of users as well as the differences between Europe and Latin America in relation to cultural contexts and design strategies. Students will be introduced to the concept of 'cultural hybridization' in order to study the complexity of Europe and Latin America

Interdisciplinary Competence

Nowadays complex problems cannot be solved within the boundaries of a single scientific discipline. The goal of this seminar is to provide students with an in-depth understanding of interdisciplinarity and an awareness of the tools that facilitate interdisciplinary research.

4th Semester

Master's thesis

The development and realization of your master's thesis will give you the opportunity to prove, theoretically and practically, your ability to research independently and scientifically a given interdisciplinary theme, under the current scientific requirements.